WHEELED CONTAINER TRANSFER SELF-ALIGNING PLATFORM FOR MARINE TERMINAL CRANE

[0001] The present invention relates to the transfer of containers by means of a marine terminal crane to a dockside located ship.

BACKGROUND OF THE INVENTION

[0002] Transport of loaded containers between dockside piers and ships currently involve use of a large marine terminal crane, which typically embodies a horizontally elongated boom having a rail guided trolley through which the container is delivered. At large ports such a crane is often a bottleneck when high load transfer performance is required. When container transfer between a truck and a misaligned lowered spreader bar from the crane boom is involved, repeated and time-consuming load transfer attempts are required before spreader bar attachment to the container is achieved.

[0003] It is therefore an important object of the present invention to provide for a more efficient and less time-consuming transfer of containers from trucks to ships through the aforementioned type of marine terminal crane.

SUMMARY OF THE INVENTION

[0004] In accordance with the present invention, a motorized vehicle truck carrying a container is driven onto a wheeled platform along a lowered hinge ramp at one entry end thereof. The truck with the container thereon is then automatically adjusted to a position on the platform in alignment with the spreader bar lowered from the boom of a marine terminal crane, under directional control of a sensing grid network associated with the platform. After unloading of the truck on the platform, it is driven off the platform through a hinge ramp at its other departure end.

BRIEF DESCRIPTION OF DRAWING

[0005] A more complete appreciation of the invention and many of its attendant advantages will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

[0006] FIG. 1 is a simplified side elevation view of a marine terminal crane at a dockside pier with its boom overlying a dockside located ship to which a container is transferred from a vehicle truck;

[0007] FIG. 2 is a simplified front elevation view of the container transferring crane illustrated in FIG. 1;

[0008] FIG. 3 is a partial side elevation view of a wheeled support platform being towed by a motorized vehicle truck;

[0009] FIG. 4 is a side elevation view of the wheeled platform positioned with hinged ramps at opposite ends in lowered position;

[0010] FIG. 5 is a top plan view of the platform shown in FIG. 4;

[0011] FIG. 6 is a section view taken substantially through plane indicated by section line 6-6 in FIG. 5;

[0012] FIG. 7 is a partial section view taken substantially through a plane indicated by section line 7-7 in FIG. 6; and

[0013] FIG. 7A is a section view corresponding to that of FIG. 7, showing the platform table displaced from the neutral position illustrated in FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] Referring now to the drawing in detail, FIG. 1 illustrates a marine terminal crane 10 of a type generally known in the art, mounted on a dockside pier 12. The crane 10 includes a horizontally elongated boom 14 extending from crane gentry legs 16 over a ship 18 located alongside of the pier 12 for unloading of containers 20 thereon from the boom 14. As also shown in FIG. 1, one of the containers 20 is located between the crane gentry legs 16 on a truck 24 positioned on a self-aligning platform 22.

[0015] The platform 22 is transported to the crane location on the pier 12 by a motorized truck vehicle 24 as shown in FIG. 3. Thereafter, a truck 24 with a container 20 thereon is positioned on the platform 22 in alignment with a crane spreader bar 25 so that the container 20 may be lifted onto the boom 14 as shown in FIG. 2.

[0016] Referring now to FIGS. 3, 4 and 5, the self-aligning platform 22 includes a generally rectangular frame 26 having ramps 28 hinged thereto at opposite ends. The ramp 28 at one end of the platform frame 26 is folded upward to accommodate attachment of the truck 24 as shown in FIG. 3 for transport of the platform 22 to the pier 12. Both of such ramps 28 are positioned outwardly onto the ground as shown in FIG. 4. Three floating tables 30, 32 and 34 are positioned in the platform frame 26 as shown in FIG. 5. Each of such tables 30, 32 and 34 is provided with a set of four support wheels 36 on opposite sides thereof to respectively establish a wheeled chassis for the truck 24, a 20 ft. chassis and a 40-45 ft. chassis.

[0017] Associated with each set of the table supporting wheels 36 on the underside of each of the tables 30, 32 and 34 as shown in FIG. 7, are linear rotary bearing assemblies 38 slidable along and rotatable on fixed shafts 39 mounted on the platform support frame 26, which is also provided with a pair of ball screw drive systems 40 and 42. Thus, as shown in FIG. 7A,

the tables 30, 32 and 34 may be displaced in two 90° related directions from its central neutral position to a limited extent. The tables 30, 32 and 34 may accordingly be adjustably repositioned while on the pier 12 in 90° related directions into alignment with the crane spreader bar 25 while providing a bearing supported surface thereon for the container 20 to be transferred therefrom onto the crane boom 14.

[0018] Also provided on the opposite sides of the platform frame 26 at the locations of the support wheels 36 are pairs of vertically extending triangular plates 44 having sensor elements 46 mounted at the upper ends thereof to form sensing grid or arrays 48 for locationally positioning of the truck 24 with the container 20 on the platform 22 so as to maintain the same aligned position of the platform table 30, 32 or 34 relative to the crane spreader bar 25 regardless of the initial positioning of the platform 22 by the truck 24. Transfer of the container 20 between the platform 22 and the crane boom 14 is thereby accommodated.

[0019] In view of the foregoing described arrangement, the platform 22 may be moved into position between the legs 16 of the crane 10 by the truck 24 which is then disengaged therefrom. A truck 24 with a container 20 thereon may then drive up one of the ramps 28 onto the initially positioned platform 22 as shown in FIGS. 1 and 2. Through the sensor grid 48, the upper corners of the container 20 are located to provide signals for control of the drive systems 40 and 42 for optimized positioning of the platform tables 30, 32 and 34 to align the container 20 with the spreader bar 25 for lifting thereof from the platform 22, after which the truck 24 may drive off the platform ramp 28 at the platform departure end opposite the approach end. The tables 30, 32 and 34 may then be realigned through the drive systems 40 and 42 to the initial neutral position before another truck drives onto the platform 22 with a container 20 to begin another repeated container transfer process with enhanced efficiency and reliability.

[0020] As a result of the foregoing described platform 22 with associated components such as the directionally aligned tables 30, 32 and 34 with the directional drive systems 40 and 42 and the sensing control grid 48, drivers of trucks 24 require less skill and maneuvering activity. Also since downward movement of the crane spreader bar 25 to only one position is required because of the automatic alignment table positioning control provided, so that the requirement for crane operator skill and operator fatigue are reduced.

[0021] Obviously, other modifications and variations of the present invention may be possible in light of the foregoing teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is: